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INSTITUTE OF GAS TECHNOLOGY

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CHICAGO 16, ILLINOIS

GAS ABSTRACTS

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1. GAS INDUSTRY

Conversion Program

Rafferty, J. C. BROOKLYN UNION BEGINS SIX-MONTH PROGRAM OF "BIGGEST CONVERSION IN THE WORLD". *Gas Age*, 109, 38, 39, 70-72 (1952) March 27.

A discussion of the method of conversion from manufactured gas to natural gas in the Brooklyn Union distribution area is given.

D. L. Nicol

Fuel Markets

Richmond, K. C. HEATING AND FUEL MARKETS—MANUFACTURING PLANTS. *Coal-Heat*, 62, 16 (1952) May.

Probably 170,000 of the nation's manufacturers are served by retail coal dealers (delivered by truck). A survey covering 317 plants in the Midwest shows 48% rated below 150 hp and 30% between 151 and 300 hp. The average is 229 hp, indicating a "typical" plant consuming about 1100 tons coal/year. Because of unknown load factor, and boiler efficiency, this is no more typical than the national average consumption of 416 tons (110,000 tons coal for 240,000 plants). The "typical" plant is much smaller, a large percentage of plants averaging 125 to 150 tons/year.

O. P. Brysch

Gas-Electricity Competition

Buckham, S. G. COMPARISONS BETWEEN GAS AND ELECTRICITY. *Gas J.* (British), 269, 769-778 (1952) March 26.

The competitive positions of gas and electricity as fuel in England is discussed. With a cost ratio of 16½ to 29 in favor of gas the electric salesmen are making appreciable inroads on heating appliances.

D. L. Nicol

Gas Rates and Costs

GAS RATES LAG AS COSTS RISE. *Am. Gas Assoc. Monthly*, 34, 15, 16, 43 (1952) April.

Higher gas rates are required due to increased production and operating costs. While the cost of living has risen 90% the cost of gas to residential consumers has risen but 3%. An analysis of costs made by AGA is reported.

J. D. Parent

Gas Reserves

RECORD GAINS FOR GAS RESERVES. *Am. Gas Assoc. Monthly*, 34, 3-6 (1952) April.

The natural gas and natural gas liquids reserves as of the end of 1951 are reported. Large gains are shown in spite of record production. Natural gas reserves climbed to 193.8 trillion cubic feet. This figure includes 474 billion cubic feet in underground storage.

J. D. Parent

Regulation of Production

Duff, D. M. GAS CONTROL OPPOSED. *Oil Gas J.*, 49, 111, 112 (1952) April 14.

Lyon F. Terry states that federal regulation of natural gas production might be patterned after that imposed on transmission companies to the ultimate disadvantage of the residential consumer. Limited earnings and costly procedures for exploration approval might be very serious. Terry advocates reaffirming by Congress of the original exemption of production and gathering in the Natural Gas Act of 1938.

J. D. Parent

Uniform Operation

N.A.R.U.C. PROPOSES UNIFORM RULES FOR GAS UTILITY OPERATION. *Gas Age*, 109, 51-53, 89-93 (1952) March 13.

A set of rules on gas utilities operation has been proposed to the state commissioners by the National Association of Railroad and Utilities Commissioners, so that a uniformity may exist between states. These rules as presented in this article cover methods and conditions of service such as continuity of service, quality control, meters, customer relations, design and construction of plant, system operations and records.

S. Mori

The following article, the abstract for which appear on the page indicated, is also called to your attention:

Darrow, J. C. DISTRIBUTION CRISIS FOLLOWING PIPE-LINE BREAK. p. 114.

2. APPLIANCES

Draft Control

Smith, E. A. DRAFT CONTROL WITH LARGE BURNERS. *Gas Heat*, 3, 23, 40, 66 (1952) April.

Some of the reasons why the common draft diverter has not proven entirely satisfactory, when used with large gas burners are pointed out. Only when the burner and boiler combination is such that draft for proper combustion is developed can a diverter be used.

B. G. Lang

House Heating Comparisons

Lant, F. C. and Weston, J. C. AN INVESTIGATION OF WHOLE-HOUSE HEATING. *Gas Times*, (British) 70, 260-265 (1952) February 22.

A study of gravity hot water and forced warm air heating systems was made for an economic analysis of central house heating as compared with localized stoves. The efficiency of gas-fired system was quite higher compared to the conventional system 80% and 49%. However, the higher cost of gas offsets the higher efficiencies to result in a relative cost of 125% of the conventional system. D. L. Nicol

Water Heaters

STUDY OF PERFORMANCE CHARACTERISTICS OF GAS BOILERS EQUIPPED FOR HOT WATER AND SPACE HEATING SERVICES. Research Report No. 1185. Am. Gas Assoc. Committee on Domestic Gas Research, Project DGR-3-CH (1952) February.

Stand-by loss and waterheating service efficiency data were determined for two typical systems operated as hot water heaters without flue connections. Variables investigated were insulation boiler operating temperatures, quantity of water drawn, shock recovery coils with insulated storage and instantaneous coils. An overall heating efficiency of 22% was attained for a 50-gallon draw of 140° F. water per day.

D. L. Nicol

The following article, the abstract for which appear on the page indicated, is also called to your attention:

Bailey, N. P. FLOW AND COMBUSTION STABILITY. p. 118.

3. COMBUSTION AND INDUSTRIAL FURNACES

Burner

Campbell, D. A. and Buck, R. M. (assigned to Affiliated Gas Equipment, Inc.) COMBINED INSPIRATOR AND GAS BURNER. U.S. 2,592,007 (1952) April 8.

An industrial burner-mixer is described. Gas is entrained into an air stream flowing in an annular venturi. Advantages claimed are to reduce size and energy losses. D. L. Nicol

Burner

Nesbitt, J. D. and Schramm, H. W. (assigned to Surface Combustion Corp.) RADIANT WORK HEATING GAS BURNER. U.S. 2,591,283 (1952) April 1.

A radiant industrial gas burner is described. Novel features include water cooled jackets backing the refractory burning surface.

D. L. Nicol

Gas Boiler Fuel

Whatley, W. J. NATURAL GAS FIRING AND CONTROL FOR BOILERS. *Southern Power Ind*, 70, 80-82, 96 (1952) April.

Automatic controls will produce uniform steam pressure, which means higher engine or turbine efficiency. Fuel and time saving, increased boiler output, lower furnace maintenance, and greater safety are advantages of automatic controls over manual operation. Included are specifications and details for a typical controlled gas combustion as applied to steel steam-heating boilers.

B. G. Lang

Gas Turbines

Bowen, I. G. GAS TURBINES. PART I. *Coke and Gas* (British), 14, 87, 92, 110 (1952) March.

This is the first part of a survey dealing with current gas turbine design which covers the fundamentals factors. Starting with the fundamental cycle the treatment leads to more complex cycles and varied arrangements including combinations with steam turbines and diesel engines. Thermodynamic diagrams and flow diagrams are included.

E. J. Pyrcioch

Ignition

Sloan, S. A. (assigned to Peabody Engineering Corp.) AUTOMATIC GAS IGNITER TUBE FOR BURNERS. U.S. 2,591,626 (1952) April 1.

An individual burner ignition system is described. A combination valve insures that the ignition spark can not be started until the burner is first purged. D. L. Nicol

Industrial Drying

Lyons, E. L. ROOFING FELT PRODUCTION IS INCREASED BY ADDING GAS DRYING EQUIPMENT. *Am. Gas J.*, **176**, 16-17 (1952) March.

Felt web leaves the paper-making machine with 65% water by weight. This must be reduced to less than 5% before it is asphalt-impregnated. Installation of 9 line-type radiant gas burners, 77″ long, using 6,000 CF gas per hour, has sped up the machine 12-15%. The refractory backing glows at approximately 2600° F. B. G. Lang

Wood-Gas Heater

Perkins, R. C. GAS PRODUCING FURNACE AND BURNER THEREFOR. U.S. 2,592,730 (1952) April 15.

This furnace produces gas from wood or other carbonaceous plant growth. The gas is burnt and heat is used for heating dwellings.

B. G. Lang

4. CARBONIZATION AND GASIFICATION

CO_2 Removal

Haywood, F. W. and Laidler, D. S. (assigned to Wild-Barfield Electric Furnaces Ltd.) CATALYTIC TREATMENT OF INDUSTRIAL GASES. U.S. 2,591,543 (1952) April 1.

A process is described for the removal of carbon dioxide and oxygen from industrial gases by passing the gas over barium carbonate at approximately 900° C.

H. A. Dirksen

Coke Pushing Interlock

Drake, J. W. (assigned to Koppers Company, Inc.) PUSHER MACHINE AND COKE GUIDE INTERLOCK. U.S. 2,589,231 (1952) March 18.

This invention prevents the accidental pushing of a coke oven when one of the machines is aligned but the other is not. A pressure fluid supply source carried on one of the machines is coupled temporarily, when in proper position, to a pipeline which runs beneath the battery under the particular oven. When the machine on the other side of the battery is properly aligned, it can be coupled only to this particular pipeline (of the several which correspond in number to all other coke ovens in the battery). Only when so coupled ("interlocked") will the fluid build up a pressure sufficient to actuate the power switch of the pusher-ram; thus pushing accidents and damage are avoided.

O. P. Brysch

Lavely, P. H. (assigned to Koppers Company, Inc.) AUTOMATIC INTERLOCK FOR PUSHER MACHINES AND COKE GUIDE MACHINES. U.S. 2,589,266 (1952) March 18.

This invention provides refinements in the air-connections and electrical switches which permit automatic operation of the pusher machine-coke guide interlock device described in Drakes Patent No. 2,589,231.

O. P. Brysch

Coking Additives

Berl, E. COKING COAL. U.S. 2,591,496 (1952) April 1.

Conversion products resulting from alkali treatment of carbohydrate materials at high temperatures and pressures in presence of noncoking anthracites or of low-rank coals or lignites, are then carbonized in a separate stage to yield good metallurgical coke. O. P. Brysch

Holder Inspection

Dalby, D. P. THE INSPECTION AND CARE OF GAS HOLDERS. *Gas World* (British), **135**, 323-325 (1952) March 29.

Holder inspection should be more than just a mere walk around the holder. The holder should be checked carefully for corrosion, holder cups should be checked periodically for acidity, all rollers and guides kept lubricated, all holder valves in perfect operating condition, and the anti-freeze system ready for full protection.

B. G. Lang

Hydrocarbon Oxidation

Lynch, C. S. and Corner, E. S. (assigned to Standard Oil Development Co.) OXIDATION CARRIER FOR THE OXIDATION OF HYDROCARBONS. U.S. 2,588,260 (1952) March 4.

An oxygen carrier consisting of 10 to 40 weight per cent of a 50-50 iron oxide-manganese oxide mixture is used for the oxidation of hydrocarbons to carbon monoxide and hydrogen.

H. A. Dirksen

Oil Gas

Deanesly, R. M. (assigned to Universal Oil Products Co.) CRACKING HEAVY OILS IN PRESENCE OF OXYGEN. U.S. 2,587,703 (1952) March 4.

Heavy oil is preheated and fed into a relatively small confined reaction zone with steam and air or oxygen. An autothermic cracking of the oil stream, under substantially adiabatic and short residence time conditions occurs, and the resulting lower molecular gases and coke and tar fog pass into a large bed of fluidized coke-like particles where tar fog is trapped, and further cracking may occur.

B. G. Lang

Oil Gas Conversion

Mager, A. M. NEW BEDFORD "PLAYS IT SAFE" IN CONVERTING TO OIL GAS. *Gas*, 28, 68-71 (1952) February.

A brief case history is given of the conversion to an oil gas of 1004 Btu/SCF and 0.87 specific gravity. Instructions were to drill burners only when necessary. Surveys show a good safety record for the job.

D. L. Nicol

Water Gas Production

Sherwood, P. W. PETROCHEMICALS FROM WATER GAS. PART I. ADVANTAGES AND DRAWBACKS OF THE MAJOR PRODUCTION PROCESSES. *Petroleum Eng.*, 24, C28-C35 (1952) April.

This article contains a survey of methods and conditions for production of water gas by 1) steam reforming of methane, 2) partial combustion of methane with oxygen, 3) gasification of solid fuels. A discussion of purification of water gas for chemical operations is also included.

C. A. Hall

Wood Carbonization

Thomsen, S. CARBONIZING UNIT. U.S. 2,589,895 (1952) March 18.

An apparatus for carbonizing wood or waste vegetable matter is claimed, which comprises a gas-fired furnace-setting which heats a long cylindrical retort. The retort contains a screw conveyor which carries raw material from a feed hopper through a carbonizing zone and then through a cooling zone. A gas take-off chamber is provided at the end of the carbonizing zone for recovering distillates.

O. P. Brysch

5. NATURAL GAS AND NATURAL GAS CONDENSATES

Carbon Black

Skoog, R. W. and Drogin, I. (assigned to United Carbon Co.) APPARATUS FOR THE MANUFACTURE OF CARBON BLACK. U.S. 2,590,660 (1952) March 25.

The patent relates to carbon black manufacture. Its objects are to use auxiliary means for heating the furnace separately from the reacting hydrocarbons, and to use hydrocarbons preheated to about furnace temperature.

J. D. Parent

Sweitzer, C. W. (assigned to Columbian Carbon Co.) CARBON BLACK PELLETING PROCESS. U.S. 2,591,024 (1952) April 1.

This patent relates to pelletizing furnace blacks without binders to form a strong but readily dispersible product. Furnace blacks with 0.1 to 0.2% acetone-extractable material are successfully processed by rapid heating to a temperature sufficient to soften but not coke this component. Time and temperature are both important.

J. D. Parent

Cave Storage

Pattinson, R. L. METHOD OF STORING GASES OR LIQUIDS. U.S. 2,590,066 (1952) March 1.

The storage of gas in caverns leached out of underground salt beds has been discussed in the

literature for some time. This topic is made the subject of a patent for storing either manufactured or natural gas at superatmospheric pressure. The manner of obtaining a cavern is unspecified.

J. D. Parent

Compressor Leakage

Jones, W. F. (assigned to Carrier Corporation) ARRANGEMENT FOR COLLECTING AND UTILIZING NATURAL GAS LEAKAGE FROM A CENTRIFUGAL COMPRESSOR EMPLOYED ON A PIPE LINE. U.S. 2,588,-122 (1952) March 4.

This invention describes an equipment for collecting and utilizing natural gas leakage from a centrifugal compressor employed in a pipeline. A simple labyrinth seal is used around the compressor shaft. This allows a small leakage of gas thus maintaining a pressure slightly above atmospheric in the bearing space. All this leakage gas is collected through suitable piping and utilized in the boiler house.

D. C. Gami

Distribution Problems

Van Vliet, R. HAS OIL FOGGING AND HUMIDIFYING ACCOMPLISHED WHAT WE WISHED? *Gas Age*, **109**, 21-28, 69-70 (1952) March 27.

This report covers the experiences of the New York and Richmond Gas Company since their conversion to natural gas two years ago. The general conclusions are that both humidifaction and oil fogging are necessary when distributing natural gas in a water gas system. The main reasons for the operations are the control of dust, prevention of drying of the caulked pipe joints, and the preservation of meter leathers. No final answer to the questions of how much (oil fogging and humidifications) and where can be made from the data accumulated to date.

W. G. Bair

Drilling

Carlson, R. F. DRILLING WITH GAS. *Oil Gas J.*, **49**, 98, 99 (1952) April 14.

After setting 450 ft. of surface pipe with cable tools and 1,510 ft. of intermediate pipe with rotary equipment using mud, a well in West Texas was rigged for use of gas in place of mud. Drilling has been faster than with mud, and has been possible because of lack of fluid in the formations encountered. However, rock pressure is expected to be 6,500 psi, so mud will be used for completion. 1,500 Mcf of gas has been used per day in this work. Gas pressure is 125 psi.

J. D. Parent

Lahee, F. H. EXPLORATORY DRILLING IN 1951. *Oil Gas J.*, **50**, 98-107 (1952) April 7.

A statistical review including maps, graphs, and tables on exploratory drilling is given.

J. J. Guyer

Dust Scrubbing

Ansell, D. W. HOW USE OF DIETHYLENE GLYCOL SOLVED A PROBLEM IN LINE DUST SCRUBBER. *Gas Age*, **109**, 48, 49 (1952) April 10.

This article discusses the experience of Mountain Fuel Supply Co. with diethylene glycol as a scrubbing medium in gas line dust scrubbers. Great difficulty was experienced with the usual scrubber oil because of the presence of heavy hydrocarbons in the gas. Diethylene glycol was quite satisfactory as a scrubbing medium. It is probably necessary to filter the glycol solution every two or three years.

O. T. Bloomer

Gas Conditioning

Russell, G. F., Jr. (assigned to Aluminum Company of America) GAS TREATMENT AND APPARATUS THEREFOR. U.S. 2,588,296 (1952) March 4.

Essentially, the proposed system is designed to avoid corrosion of tubing and casing by preventing condensation. This is to be achieved by drying the gas from the well and compressing and recycling part of it to the lower regions of the well.

Abstractor's note: Compression and recycling would increase the difficulty of liquid hydrocarbon recovery and would mean re-treating the recycled gas.

J. D. Parent

Geophysical Exploration

Hammer, S. GEOPHYSICAL EXPLORATION COMES OF AGE. *Petroleum Eng.*, **24**, B84-B88 (1952) April.

This article discusses the relatively short history of geophysical exploration and predicts what the future has in store. The history of geophysical exploration starts in 1920 when seismic and gravity crews were brought from Germany to the Gulf Coast to search for salt-dome oil fields. Last year $325,000,000 was invested in geophysical exploration. Figures are presented to show that geophysical exploration in connection with geological exploration, has six times as great a chance for success as non-technical drilling and twice as great a chance for success as geological exploration alone. At present this method of exploration provides a one-in-five chance of success. The author states the simplicity of some of the equipment and concludes that the time is not far off when geophysical exploration will be in great demand by other mineral industries.

L. Miller

Line Break Emergencies

Darrow, J. C. HOW TO SOLVE A DISTRIBUTION CRISIS FOLLOWING PIPE LINE BREAK. *Gas Age*, **109**, 32-34 (1952) March 27.

In emergencies such as described it is essential that key personnel in both transmission and distribution are familiar with the transmission facilities. Of paramount importance is the notification of the customers that such a situation exists.

B. E. Hunt

Natural Gasoline

Laurence, L. L. STABILIZATION OF HIGH-GRAVITY CONDENSATE AND PRODUCTION OF NATURAL GASOLINE. *Oil Gas J.*, **50**, 138-146 (1952) April 14.

This article discusses the equipment used for the field stabilization of the condensate produced by low-temperature field separators. Increased recovery of stock tank liquid is obtained. The stabilized liquid can be fractionated to produce a specification natural gasoline and thereby increase the value of the liquid products.

O. T. Bloomer

Ratzlow, V. R. and Ruoho, A. A. WEST TEXAS NATURAL GASOLINES — THEIR COMPOSITIONS AND PROPERTIES. *Petroleum Refiner*, **31**, 125-128 (1952) April.

Here is presented the results of a precise determination of the composition and properties of two West Texas natural gasolines. These gasolines were carefully fractionated into 0.1 volume percent or smaller fractions which were analyzed to determine the compositions. About 95 percent of the debutanized gasolines were quantitatively identified as individual hydrocarbons; the unidentified components were in the eight-carbon and heavier fractions. The distribution of sulfur in these gasolines was also determined as were the antiknock and other physical properties of fractions simulating products that are or could be manufactured commercially.

Authors' Abstract

Odorization

EXPANDING WITH GAS. *Chem. Week*, **70**, 57-58 (1952) April 26.

The characteristics of an ideal odorant are described. The developments and products of the major producers of odorants are discussed. A demand for 3.5 million pounds of odorant by 1955 is expected due to the increased use of natural gas. A rise in mandatory odorization may increase this demand substantially. Current cost of gas odorization using mercaptans is about 50-60 cents per million cubic feet. Cyclic sulfides are more expensive but are chemically more stable

C. E. Hummel

Sulfur Recovery

Blohm, C. L. NEW LIGHT ON PROCESSING SULFUR-BEARING GASES. *Oil Gas J.*, **50**, 89-93 (1952) April 28.

This article deals with the economics of processing sulfur-bearing gases. Several assumptions are made: (1) that the recovery unit is operated in conjunction with a gas-treating plant, thus providing a feed stock, cooling water, boiler feed water, electricity, and start-up fuel and steam at a nominal cost. (2) that the carbon dioxide content of the feed stock is small enough to enable a single-stage converter to be used, oxidizing the hydrogen sulfide with

air directly to elemental sulfur. Graphs are given, relating the theoretical equilibrium conversion and dew-point curves for the oxidation of hydrogen sulfide, and plant capacity versus investment and operating costs. The article makes clear that the design of any proposed recovery unit must be governed by the specific conditions of feed stock composition, plant capacity desired, and market availability.

J. I. Wrozina

Jones, H. H. and Graff, R. A. WEST TEXAS' FIRST SULFUR-RECOVERY UNIT. *Oil Gas J.*, 50, 122, 123, 153, 154 (1952) April 21; *Petroleum processing* 7, 648-650 (1951) May.

The Sid Richardson Carbon Co. and Odessa Natural Gasoline Co. have started operation of a 20-ton per day sulfur-recovery unit, using residue gas which has been processed in an amine-type residue-gas-desulfurization unit as a feed stock. The process used is a modification of the Claus: one-third of the hydrogen sulfide stream is oxidized to sulfur dioxide and then reacted with the remaining two-thirds in a catalytic converter. The redox reaction produces elemental sulfur and water. Both reactions are exothermic and the reactants of the second must be cooled, due to the presence of a large amount of carbon dioxide in the feed stock, to prevent the formation of undesirable carbon oxysulfide. The reaction products from the catalytic converter are cooled by a circulating stream of molten sulfur, the condensed sulfur pumped to an elevated accumulator, and the waste gases are vented to the atmosphere. An iron-type natural bauxite is used as a catalyst, having to be replaced every 2-3 years; conversion to elemental sulfur is 90%.

J. I. Wrozina

LIQUID SULPHUR DIOXIDE FOR SULPHITE MILLS. *Can. Chem. Processing*, 36, 54-57 (1952) March.

This fall Canadian Industries Limited's Copper Cliff plant will be producing 90,000 tons of liquid SO_2 annually. This is equal to the rest of the free world's output. The plant is being constructed beside the International Nickel Company of Canada Smelter, and will use smelter gas as feed stock. Flow diagrams of the plant are included.

B. G. Lang

Transmission

Sterrett, E. TEXAS-ILLINOIS STATIONS DESIGNED FOR HIGH THROUGHPUT. *Pipe Line News*, 24, 41-46 (1952) March.

The use of standard equipment is the key point in the design of Texas-Illinois Pipeline Co. stations. For example the 200 H.P. two-cycle type UTC vertical Worthington compressor unit was selected for all stations. Detailed description and pictures of the compressors and piping and cooling systems are given.

D. C. Gami

The following articles, the abstracts for which appear on the pages indicated, are also called to your attention:

Duff, D. M. GAS CONTROL OPPOSED. p. 109.
Martin, A. B. SOLIDIFYING TEMPERATURES OF VAPORS DISPERSED IN GASES. p. 117.

Rafferty, J. C. BROOKLYN UNION BEGINS CONVERSION PROGRAM. p. 109.

Reeves, E. J. DETERMINING VOLUME CHANGES IN HYDROCARBON BLENDING. p. 118.

6. PETROLEUM AND SYNTHETIC LIQUID FUELS

Alberta Tar Sands

CANADIAN FIRMS TACKLE ALBERTA OIL SANDS. *Can. Chem. Processing*, 36, 10-12 (1952) April.

U.S. oil reserves are topped by a ratio of 8 to 1 by Alberta's tar sands. Ten Canadian firms are preparing to process the sands, and projected plants would have a capacity of 20,000 bbls. per day. Estimates place the mining cost at 55¢ per bbl. and processing at 72¢ per bbl. It is hoped that oil can be delivered at $4.50 per bbl. at Lake Superior or the west coast.

J. D. Parent

HOW THE "ECONOMIC IF" WAS TAKEN OUT OF THE TAR SANDS. *Can. Chem. Processing*, 36, 52-54 (1952) April.

The Mines Branch of the (Canadian) Department of Mines and Technical Surveys has conducted tests on desulfurization of oil from Alberta tar sands. Catalytic hydrogenation under

pressure is said to be successful. The oil contains 3.5% sulfur as produced and must be reduced to less than 0.25% for refining.

J. D. Parent

Catalysts

Cain, V. L., and Hemminger, C. E. (assigned to Standard Oil Development Co.) HYDROCARBON SYNTHESIS. U.S. 2,589,925 (1952) March 18.

An iron carbide containing 1.0-3.5 weight % of carbide carbon mostly in the form of Fe_5C is reacted with a synthesis gas, the hydrogen partial pressure being maintained at about 170 psi, to operate a fluidized bed and repress the formation of carbonaceous material.

H. A. Dirksen

Catalysts

Ciapetta, F. G., Buck, W. H. (assigned to The Atlantic Refining Co.) SILICA-ALUMINA-GROUP VIII METAL CATALYST. U.S. 2,589,189 (1952) March 11.

A catalyst is offered consisting of 80 to 95% silica — 5% to 20% of alumina, impregnated with 0.1 to 10% by weight of a metal of group VIII of the periodic system, for the polymerization and isomerization of normally gaseous olefin to produce gaseous or liquid polymers.

H. A. Dirksen

Catalysts

Keulemans, A. L. (assigned to Shell Development Co.) PRODUCTION OF OXYGENATED COMPOUNDS. U.S. 2,587,858 (1952) March 4.

An improvement of the Oxo Process is claimed. The improvement comprises continuously supplying cobalt to the carbonylation reactor in the form of cobalt hydrocarbonyl.

H. A. Dirksen

Catalysts

Kuhn, G. F. (assigned to Sinclair Refining Co.) APPARATUS FOR THE CATALYTIC CONVERSION OF HYDROCARBONS. U.S. 2,590,980 (1952) April 1.

An apparatus for the continuous regeneration of cracking catalysts and the like by means of a countercurrent air-catalyst flow is claimed.

W. J. Pleticka

Recovery Tracer

Bond, D. C., and Savoy, M. (assigned to The Pure Oil Co.) METHOD OF STUDYING EARTH FORMATIONS EMPLOYING ACETYLENE AS A TRACER GAS. U.S. 2,589,219 (1952) March 18.

This patent is concerned with the use of acetylene as a tracer gas in the study of flow of injection fluid used for secondary recovery of oil. If water or brine is used, it is saturated with acetylene; if natural gas is used, 1% acetylene is injected with it. A sensitive method of analysis is described.

J. D. Parent

Shale Oil Liquors

Mapstone, G. E. STUDIES IN SHALE OIL. PART II. SOME WATER SOLUBLE CONSTITUENTS. *J. Inst. Petroleum* (British) **38**, 98-107 (1952) February.

The aqueous liquors from the crude oil separators contained small amounts of ammonia, carbonates, sulphides, and thiosulphates. Cyanides and thiocyanates were absent, probably due to hydrolysis in the alkaline liquor. Both ortho- and meta-dihydric phenols were present in small amounts together with occasional traces of phenols. Aldehydes and ketones were absent, but any traces initially present would have reacted with the ammonia present. The precipitate obtained by the addition of a copper or zinc salt to the aqueous liquors contains an oil-insoluble, chloroform-soluble fraction which shows the reactions of thiocarbamates. Monoalkyl dithiocarbamates appear to be absent. The sulphur-copper ratio is about one-quarter that required for dithiocarbamates, suggesting that some of the product is monothiocarbamates together with other compounds, including carbamates. It was shown that dithiocarbamates could be formed under the conditions existing in the condensing system.

Author's Abstract

Synthetics Refining

Montgomery, C. W. and Gilbert, W. I. (assigned to Gulf Research and Development Co.) PROCESS FOR DEOXYGENATING AND ISOMERIZING A FISCHER-TROPSCH STOCK. U.S. 2,589,273 (1952) March 18.

A process for deoxygenating and isomerizing a Fischer-Tropsch stock comprises passing it

over a alumina catalyst impregnated with anhydrous hydrogen chloride at atmospheric pressure, 375° to 425° C., and a space velocity of 0.3 to 1.3.

H. A. Dirksen

The following articles, the abstracts for which appear on the pages indicated, are also called to your attention:

Kobe, K. A. EXTRACTIVE CRYSTALLIZATION—A NEW SEPARATION PROCESS. p. 120.

Lynch, C. S. OXIDATION CARRIER FOR THE OXIDATION OF HYDROCARBONS. p. 112.

Wolbert, G. S., Jr. AMERICAN PIPELINES. p. 124.

7. ANALYTICAL METHODS AND TESTS

Ethylene Determination

Young, R. E., Pratt, H. K., and Biale, J. B. MANOMETRIC DETERMINATION OF LOW CONCENTRATIONS OF ETHYLENE. *Anal. Chem.*, 24, 551-555 (1952) March.

Ethylene is absorbed from an air stream in a solution of mercuric perchlorate, forming an ethylene-mercury complex. The accumulated ethylene is later released from the complex by the addition of hydrochloric acid, and its volume is measured manometrically. This method is best suited for ethylene concentrations of 0.5 p.p.m. and higher, though not more than 0.05 p.p.m. will escape absorption. Total amounts of ethylene as low as 0.2 ml. can be determined with an accuracy of 5%, while a higher accuracy can be obtained with larger amounts. The method is specific for olefins.

C. E. Hummel

Gas Analysis

Guild, L. V. (assigned to Burtell Corp.) METHOD OF MAKING ANALYSIS OF COMPOSITE GAS MIXTURES. U.S. 2,591,808 (1952) April 8.

Platinum on pumice stone may be used as a catalyst for the combustion of hydrocarbons with oxygen in gas analysis. D. M. Mason

Gas Analysis

Zaikowsky, W. M. (assigned to Nina D. Zaikowsky) THERMAL CONDUCTIVITY GAS ANALYZER. GAS ANALYSIS APPARATUS. APPARATUS FOR GAS ANALYSIS. GAS ANALYSIS APPARATUS. U.S. 2,591,759; 760; 761; 762 (1951) April 8.

With a thermal conductivity type of gas analysis instrument, reducing the gas pressure is claimed to increase the speed of response, reduce its sensitivity to dust, water, or other liquid, reduce the effect of corrosive or other contaminating constituents, and reduce the amount of reagent, such as heated copper oxide, required for treatment of the gas. A gas-flow arrangement to make the measurement insensitive to pressure variation is described. Applications to determination of air-fuel ratio are stressed. Also described are: methods and apparatus for treatment of the gas stream in the instrument, as by heated copper oxide or drying agent; methods of combining bridge elements and methods and apparatus for mixing and arranging gas streams in order to integrate the effect of different constituents to yield an indication of the desired effect. For example, total combined oxygen in engine exhaust gas may be indicated by the proper combination of cells, all connected in the same bridge, such that water vapor is detected by a train of two cells with intervening drying agent. Carbon dioxide is detected by another cell or cells, and carbon monoxide by another cell or cells after treatment with heated copper oxide. Correction for atmospheric humidity may be made by means of an air stream simultaneously sampled through other cells.

D. M. Mason

Hydrate Detector

Martin, A. B. APPARATUS FOR DETERMINING THE SOLIDIFYING TEMPERATURES OF VAPORS DISPERSED IN GASES. U.S. 2,591,084 (1952) April 1.

This invention relates to a device for continuously recording the hydrate-formation temperature of a gas mixture containing water vapor. The gas is passed through the annulus between very closely spaced concentric tubes; the width of the annulus being of the order of 0.001 to 0.005 inches. The outer tube is cooled by a refrigerant. When the pressure drop

across the annulus increases, the hydrate is being formed. This is detected electrically by a mercury U-tube with a steel contact-wire. The refrigerant supply is then shut off and the tube allowed to warm until the hydrate sublimes away. O. T. Bloomer

Moisture in Gases

Hayworth, C. B. (assigned to Allied Chemical & Dye Corp.) DETERMINATION OF MOISTURE IN GASES. U.S. 2,594,163 (1952) April 22.

Electrical conductivity of a hydroscopic material in contact with gases containing moisture could be used as an index of the moisture content of the gases. Utilizing this principle, this invention describes a method and apparatus for continuously determining and recording moisture content of the gases. This method is specially suitable when corrosive substances are present in gases. Accuracy in measurement of 0.001 g. of water per cubic foot of gas is claimed. D. C. Gami

Oxygen in Liquids

Brooks, F. R., Dimbat, M., Treseder, R. S., and Lykken, L. DETERMINATION OF SMALL AMOUNTS OF MOLECULAR OXYGEN IN GASES AND LIQUIDS. *Anal. Chem.*, **24**, 520-524 (1952) March.

The MacHattie-Maconachie method for the determination of traces of oxygen in gases by reaction with copper has been improved and extended to the determination of dissolved oxygen in aqueous and nonaqueous liquids.
C. E. Hummel

8. GENERAL AND PHYSICAL CHEMISTRY

Blend Volumes

Reeves, E. J. DETERMINING VOLUME CHANGES IN HYDROCARBON BLENDING. *Petroleum Processing*, 7, 478-479 (1952) April.

A chart is presented for estimating the volume change accompanying the blending of light components such as ethane through butane with various heavy hydrocarbon components. Considerable deviations from ideal solution laws are indicated for some mixtures. The chart is based on data in the literature, and the deviation from non-ideal solution is attributed wholly to the contraction of the lighter component. O. T. Bloomer

Combustion Research

Bailey, N. P. FLOW AND COMBUSTION STABILITY. Am. Soc. Mech. Eng. Paper No. 51-A-83, Annual Meeting, November 25-30 (1951).

The surging, pulsation and blowout of semistable and unstable flow and combustion systems is treated with regard to basic concepts of dynamics. From this treatment stability limits can be predicted for high velocity and high energy release combustion.
D. L. Nicol

Diffusion Tracers

Hughes, H. E. and Maloney, J. O. THE APPLICATION OF RADIOACTIVE TRACERS TO DIFFUSIONAL OPERATIONS. *Chem. Eng. Progress*, **48**, 192-200 (1952) April.

The purpose of this work was to demonstrate the applicability of carbon-14 to physical-chemical investigations in the field of diffusional operations and in distillation and extraction. A Geiger-counter for use with weak beta-emitters in volatile liquid samples is described. Liquid-vapor equilibrium data were obtained on the methanol-water system and liquid-liquid equilibrium data on the methanol-n-butanol-water system. In both cases radioactive methanol was used. Radioactive counts and density determinations were used for analysis.
O. T. Bloomer

Equilibrium Vaporization

Jacoby, R. H. and Rzasa, M. J. EQUILIBRIUM VAPORIZATION RATIOS FOR NITROGEN, METHANE, CARBON DIOXIDE, ETHANE AND HYDROGEN SULFIDE IN ABSORBER OIL—NATURAL GAS AND CRUDE OIL—NATURAL GAS SYSTEMS. *J. Petroleum Technology* **4**, 99-110 (1952) April.

Experimental equilibrium vaporization ratios (K values) were obtained for nitrogen, methane, carbon dioxide, ethane and hydrogen sulfide in two natural gas-absorber oil mixtures and in two natural gas-Elk Basin crude oil

mixtures. For each mixture of constant overall composition, data were obtained at 100°, 150° and 200° F and at various pressures in the range 200 to 5,000 psia. Some effects of composition on the K values were obtained to serve as a guide in choosing K's for engineering calculations on other mixtures. The pressure cell used to obtain the data is a new type and is described here for the first time.

Authors' Abstract

Infrared Spectra

Pimentel, G. C. and McClellan, A. L. THE INFRARED SPECTRA OF NAPHTHALENE CRYSTALS, VAPOR, AND SOLUTIONS. *J. Chem. Physics*, **20**, 270-277 (1952) February.

The infrared spectra of naphthalene in the gas phase, in solutions of carbon tetrachloride, carbon disulfide, and methyl cyclopentane, and as single crystals have been obtained in the region 3300-450 cm^{-1}. The dichroism of three different single crystal planes, including the cleavage plane, has been studied using polarized infrared radiation. The frequencies were segregated into their respective symmetry classes on the basis of an assumed oriented gas model. Band contour data, together with a statistical comparison of the spectrum of the gas phase with the spectra of the condensed phases, establish the usefulness of this model.

Authors' Abstract

Schlieren Image

Holder, D. W. and North, R. J. A SCHLIEREN APPARATUS GIVING AN IMAGE IN COLOUR. *Nature* (British), **169**, 466 (1952) March 15.

Light from the white source is passed through a constant-deviation dispersion prism. The image of the source then consists of a series of colored bands, and a slit is placed in the focal plane to cut out all but a particular color. When a density gradient is then created in the working field, the image will shift relative to the slit, and will produce a color change.

E. F. Searight

Supercompressibility

Zimmerman, R. H. and Beitler, S. R. PROGRESS REPORT ON THE STUDY OF SUPERCOMPRESSIBILITY FACTORS FOR NATURAL GASES. Am. Soc. Mech. Eng. Paper No. 51-A-153, Annual Meeting (1951).

A report is given on the present status of a program (conducted at Ohio State University) to develop an accurate method of predicting the supercompressibility factors of natural gases. A working method to predict these factors is presented. The method is based on Kay's "pseudo-reduced" critical pressure-critical temperature" method s modified by Dunkle (*Gas*, October, 1944, p. 41.) Correlation equations are presented for determining the pseudo-reduced pressures and temperatures from the gravity, heating valve, and carbon dioxide content of the gas. The generalized chart is based entirely on experimental data for methane. Supercompressibility factors calculated by the working method presented are compared with experimentally determined values for 393 tests. For the temperature range 40° F. to 200° F., pressure range 0-1100 psia. specific gravity range 0.55 to 0.75 and percentage (nitrogen and carbon dioxide) 15 to 20, the average error of the working method was found to be less than 0.1%. Future work will be directed towards extending the condition to higher pressures.

O. T. Bloomer

Surface Areas

Berkowitz, N., Schein, H. G. CALCULATION OF SURFACE AREAS FROM ROOM-TEMPERATURE ADSORPTION ISOTHERMS. *Nature* (British), 169, 373 (1952) March 1.

Values for surface area of 4 lignites are given which are calculated by the (1) BET method (2) Jura-Powell or branch intersection method (3) Gregg FA-FΣ method and (4) from the s-intercept of the linear portion of the normal isotherm, for methanol at room temperatures.

O. P. Brysch

Ergun, S. DETERMINATION OF GEOMETRIC SURFACE AREA OF CRUSHED POROUS SOLIDS. *Anal. Chem.*, **24**, 388-393 (1952) February.

An analytical method of determining the geometric surface area from an empirical equation relating the mass velocity with the pressure drop per bed height per ft. of linear velocity of the gas is described. The use of the least squares method to obtain the best value for the geometric surface area is also presented.

S. Mori

9. ORGANIC CHEMISTRY

Adduct Crystallization

Kobe, K. A. and Domask, W. G. EXTRACTIVE CRYSTALLIZATION—A NEW SEPARATION PROCESS. PART I. *Petroleum Refiner*, 31, 106-113 (1952) March.

Urea selectively forms crystalline adducts with straight-chain types of compounds, while thiourea selectively forms similar complexes with many branched-chain and certain ring-type compounds. Once the crystalline complex is formed, it is removed from the reaction mixture, and the crystals are dissolved in water, destroying the complex; the reactant is then recovered as an immiscible organic layer. This type of crystalline addition complex is believed to be of the same type as exhibited by the choleic acids and the clathrates. Parts I and II of this series deal with a theoretical discussion of material related to the formation of the crystalline urea and thiourea adducts. Part III will include practical applications of the reactions and a description of the new process.

D. M. Mason

Coal Hydrogenation

Donath, E. E. CHEMICALS FROM COAL HYDROGENATION. *Mining Eng.*, 4, 381-385 (1952) April.

The possibilities of the coal hydrogenation process, as a source of chemical raw materials is discussed.

W. J. Pleticka

Cyanogen-Mercaptan Reactions

Woodburn, H. M. and Sroog, C. E. THE REACTION OF CYANOGEN WITH ORGANIC COMPOUNDS. V. MERCAPTANS. *J. Organic Chem.*, 17, 371-378 (1952) March.

Under the influence of a basic catalyst, cyanogen reacts at 5° or below with aliphatic and aromatic mercaptans to yield dithioöxaldiimidic esters, RSC—(=NH)C(=NH)SR.

Authors' Summary

Ethylene Oxide

Imhoff, D. H. and Berg, C. H. (assigned to Union Oil Co.) ADSORPTION PROCESS. U.S. 2,590,322 (1952) March 25.

The principle of selective adsorption on a solid granular bed is utilized for the separation of ethylene oxide and ethylene from gas mixtures. Coconut charcoal is used as selective adsorbent. The adsorbant ethylene is desorbed by preferential adsorption of ethylene oxide. Ethylene oxide is dissolved by pentane which is subsequently desorbed by steam and heat. Thus from a mixture of ethylene, ethylene oxide, nitrogen and carbon dioxide, both ethylene and ethylene oxide could be separated in the pure form.

D. C. Gami

Petroleum Chemicals

Guthrie, V. B. HOW BIG WILL THE INDUSTRY GROW? *Petroleum Processing*, 7, 492-494 (1952) April.

The increasing demand for synthetic chemicals holds a very bright future for petrochemicals.

J. W. Pleticka

BASIC ORGANIC CHEMICALS FROM LIGHT HYDROCARBONS. *Canadian Chem. Processing*, 36, 38-40 (1952) April.

A discussion is given of the technology to be applied to the new Edmonton Plant of Canadian Chemical Company in converting light hydrocarbons to basic organic chemicals. The process is the same as used at Bishop, Texas. The feed stock will come from gasoline plants, liquified propane and butane, and recovered gases from Edmonton refineries.

B. G. Lang

10. CHEMICAL ENGINEERING

Extractive Distillation

Wayo, S. J., Teter, J. W., and Shand, E. W. (assigned to Sinclair Refining Co.) SEPARATION OF PROPENE AND PROPANE BY EXTRACTIVE DISTILLATION. U.S. 2,588,063 (1952) March 4.

This invention relates to the separation of mixtures of hydrocarbon types of narrow boiling range by selective extraction. By using suitable solvents, e.g. mixtures of amides and nitriles, the relative volatility of the components of the hydrocarbon mixture is shifted so that easy separation of the phases could be accomplished. This mixture is very suitable for the separation of propane from propene.

D. C. Gami

Catalyst Contact

Stephanoff, N. N. (assigned to C. H. Wheeler Manufacturing Co.) METHOD OF EFFECTING CHEMICAL REACTIONS. U.S. 2,590,219 (1952) March 25.

A method of effecting chemical reaction is described by which the use of smaller catalyst particles and higher flow velocities at equivalent reaction times in a smaller apparatus are offered as improvements in the catalytic treatment of materials wherein a liquid, solid, or semi-solid catalyst is involved.

H. A. Dirksen

Design for Maintenance

Woolfenden, L. V. and Thiede, R. C. DESIGNING FOR MAINTENANCE. *Chem. Eng. Progress*, 48, 115-117 (1952) March.

The need for close coordination between the design engineer and the maintenance engineer is stressed, in order that maintenance costs and labor be minimized.

E. J. Pyrcioch

Fluidization

Packie, J. W. (assigned to Standard Oil Development Company) METHOD AND APPARATUS FOR HANDLING FLUIDIZED SOLIDS. U.S. 2,589,124 (1952) March 11.

A two-vessel fluid cracking unit is claimed which does not utilize slide valves to regulate catalyst flow between the vessels. Features of the design are the sealing sections in the transfer lines for catalyst movement. Both transfer lines are of U-shape and the lower portion of the U-tube contains catalyst of high density to provide a seal against pressure reversals. As an additional safety feature, automatic shut-off valves are operated in the catalyst inlet risers to both vessels. These valves are activated by the differential pressure across a Venturi tube. When the flow drops to a predetermined value the shut-off valve automatically closes.

W. G. Bair

Gas Fractionation

Haringhuizen, P. J. (assigned to De Directie van de Staatsmijnen in Limburg, Netherlands) PROCESS AND APPARATUS FOR THE SEPARATION OF COKE-OVEN GAS. U.S. 2,591,658 (1952) April 1.

This invention relates to a method and apparatus for separation of coke oven gas by cooling and partial condensation. This apparatus includes a new design of heat exchanger for condensing benzene, ethylene and propylene fractions in one unit. The heat exchanger is divided into three compartments so that all the fractions could be collected separately. It is claimed this new apparatus will save 30% of the heat exhanging surface.

D. C. Gami

Ore Production

Scharschu, C. A. HYDROGEN REDUCTION OF IRON ORE. *J. Metals*, 4, 250-251 (1952) March.

A brief summary is presented as to the feasibility of reducing iron ore with hydrogen today. Operational problems still existing are channelling of hydrogen gas in the ore bed, extraction of gangue from the reduced product, and prevention of oxidation due to the pyrophoric nature of the reduced ore of small diameters. There is also an economic problem of hydrogen production and an estimate of its cost is made based upon 3 different sources. These are: coke oven gas, natural gas, and propane.

S. Mori

Pebble Heater

Glaser, H. THE REGENERATOR WITH A MOVING STORAGE MASS. *Engineers Digest* (British), 13, 73-76 (1952) March.

The author presents the design of a regenerator in which the regenerative solid is moved counter-current to both gas streams. In place of reversing the flow of the gas streams, the solid is heated in the stream, drops down into the second stream where its heat is dissipated in the gas. The regeneration is designed to operate continuously. Calculations are presented to show the thermal efficiency of the system and to aid in the design of other units.

R. E. Peck

Robinson, S. P. (assigned to Phillips Petroleum Co.) PEBBLE HEATING CHAMBER. U.S. 2,593,345 (1952) April 15.

This invention has the heat-generating chamber located within the pebble heater. Increased heat transfer capacity and thermal efficiency are claimed.

E. J. Pyrcioch

Pulverizers

Dufour, M. F. and Chatelain, J. B. ULTRA-FINE GRINDING AND CLASSIFICATION WITH FLUID JET PULVERIZERS. *Mining Eng.*, **4**, 262-264 (1952) March.

The fluid jet pulverizer is a grinding device capable of pulverizing and classifying solids to a size of 5-microns or smaller. Grinding is accomplished by collisions between particles, with the energy being supplied by compressed fluids entering the grinding chamber tangentially and at high velocities. Compressed air and steam are the fluids most generally used, steam having the advantage of lower cost and a realization of a higher capacity from the same size mill. The feed is normally precrushed in impact-type equipment to at least 10-mesh. Operating data for type of pulverizer called a "micronizer" are included.

E. J. Pyrcioch

Pumps

Dolman, R. E. PUMPS. *Chem. Eng.*, **59**, 155-169 (1952) March.

This article contains descriptions of the various classes of pumps including testing, principles of operation, basic types, characteristics, materials of construction, size, typical applications, advantages, and disadvantages of each class. A section of the article is concerned with the basis for selection of pumps for a chemical plant. Schematic sketches together with graphs indicating performance characteristics are included.

J. J. Guyer

Reactor Design

Baron, T. GENERALIZED GRAPHICAL METHOD FOR THE DESIGN OF FIXED BED CATALYTIC REACTORS. *Chem Eng. Progress*, **48**, 118-124 (1952) March.

The article presents a graphical method of designing cylindrical chemical reactors. Mass and heat transfer in a radial direction are accounted for in the results. The calculations are in agreement with data which is included with this article as well as data in the literature. Where the thermal conductivity of the solid packing is low, the thermal diffusivity is approximately equal to the diffusivity for mass transfer. In order to carry out the calculation, it is necessary to have data from an isothermal reactor as well as diffusivity data. The method would be applicable to all heat transfer problems where cylindrical symmetry can be assumed.

R. E. Peck

Stack Design

Gosline, C. A. DISPERSION FROM SHORT STACKS. *Chem. Eng. Progress*, **48**, 165-172 (1952) April.

Several theoretical formulae have been developed to define the atmospheric "cone" in which stack gases are dispersed. The concentration of pollutants in this cone depends, among other factors, on the wind velocity, stack height, distance from stack on the longitudinal axis and the vertical and horizontal diffusion coefficients. Experimental data were taken at various heights and distances from an 80 ft. high stack. Using assumed values of the vertical and horizontal diffusion coefficients and dilution factors, a close agreement was obtained between experimental and theoretical results.

C. von Fredersdorff

Thermal Conduction of Beds

Molino, D. F. and Hougen, J. O. THERMAL CONDUCTIVITY OF GRANULAR SOLIDS THROUGH WHICH GASES ARE FLOWING. *Chem. Eng. Progress*, **48**, 147-149 (1952) March.

An empirical correlation was developed applicable for both heating and cooling of gases flowing through a bed of granular solids. The average result is

$$\frac{k_e}{k_g} = \frac{1.23}{F}\left(\frac{\sqrt{a\,G}}{V}\right)^{0.43}$$

where a = the average surface area of pellet, sq.ft.
F = the superficial void fraction in bed
G = the mass velocity of fluid based on empty tube lb/hr.sq.ft.
k_e = the effective thermal conductivity of packed bed, Btu.ft./hr. sq.ft. °F.
k_g = the thermal conductivity of fluid
V = the average viscosity of fluid lb/ft.hr.

C. von Fredersdorff

11. PROCESS EQUIPMENT AND INSTRUMENTATION

Dew-Point Recorder

Kamm, C. W. and Sisco, C. W. (assigned to Surface Combustion Corporation) APPARATUS FOR DETECTING WATER VAPOR IN GASES. U.S. 2,593,313 (1952) April 15.

This invention relates to an instrument for recording the dew-point temperature of gases which are low in water-vapor content. The instrument utilizes a chilled mirror with photoelectric detection of the dew-point. Special means are provided to produce a uniform cooling rate of the mirror and a timing device is incorporated to allow condensations to be evaporated from the mirror surface. It is claimed that dew-points down to −40° F. may be detected. O. T. Bloomer

Fluidizer Drain-Valve

Debo, D. G. (assigned to Standard Oil Co.) TANGENTIAL CYLINDER VALVE. U.S. 2,587,704 (1952) March 4.

A novel design of a throttling valve for handling fluids containing suspended solids is described. Essentially the valve consists of 2 parallel cylinders each flattened on one side. These cylinders are rotated on parallel axes in opposite directions to obtain rectangular openings of various widths, from full-open when the flattened portions are opposite to full-closed when the cylindrical surfaces make contact. The invention is applied specifically as a back-pressure valve in the regenerator exhaust line of a fluid cracker. The valve design affords higher resistance to erosion, and also will maintain throttling action after considerable erosion has taken place. It can be built to fit any size of conduit. W. G. Bair

Heat Exchanger

Ris, K. B. (assigned to The Griscom Russell Co.) HEAT EXCHANGER. U.S. 2,590,465 (1952) March 25.

A heat exchanger for cooling fluidized solids by contact with cooling tubes is covered by this patent. E. J. Pyrcioch

Pressure Regulation

MacLean, A. D. SAFETY IN THE REGULATION OF GAS PRESSURES. *Gas*, 28, 51-57 (1952) April.

This is a discussion of safety in pressure control. Means of preventing high or low pressures are described. B. G. Lang

The following articles, the abstracts for which appear on the pages indicated, are also called to your attention:

Drake, J. W. PUSHER MACHINE AND COKE GUIDE INTERLOCK. p. 111.

Zaikowsky, W. M. THERMAL CONDUCTIVITY GAS ANALYZER. p. 117.

12. MATERIALS OF CONSTRUCTION

Carbon Refractories

CARBON—A REFRACTORY AND MATERIAL OF CONSTRUCTION *Ceramics* (British), 4, 7-15 (1952) March.

The advantages and various uses of carbon as a refractory material are presented in this article. Its inertness, relatively high resistance to chemical and also to thermal shock, and its high thermal conductivity make it useful for various types of equipment. It can also be subjected to high temperatures under a reducing atmosphere. S. Mori

Cathodic Protection

MAGNESIUM SAVES WATER HEATING TANKS. *Gas Heat*, 3, 32, 66 (1952) April.

The advantages of applying cathodic protection to domestic water heating tanks are discussed. B. E. Hunt

Corrosion

Beildeck, B. M. and Noss, O. F., Jr. SALT-WATER CORROSION IN REFINERY COOLING EQUIPMENT. *Oil Gas J.*, 50, 296-304 (1952) March 17.

A greatly increased corrosion rate in heat exchange equipment was attributed to: 1) increase in foreign matter, including dissolved oxygen in the cooling water (from the Los Angeles harbor; 2) higher tube skin temperatures. Improved screening and equipment cleaning together with lowered temperatures have reduced the corrosion problems. C. A. Hall

Marsden, A. CORROSION—ITS CAUSES AND PREVENTION. PART II. *Ind. Finishing* (British), **4**, 612-616 (1952) March.

The second part of this article discusses the various conditions which will require preventive measures or protective coatings. Protective coatings are classified as surface films, metallic films, and paint films. B. E. Hunt

Marsden, A. CORROSION—ITS CAUSES AND PREVENTION. PART III. *Ind. Finishing* (British) **4**, 697-699 (1952) April.

The subjects of underwater and underground corrosion, and of protection against corrosion are discussed briefly. B. E. Hunt

Parker, M. E. CORROSION AND ITS CONTROL. PART 49. CORROSION OF SUBSURFACE EQUIPMENT IN PRODUCING WELLS. *Oil Gas J.*, **50**, 137 (1952) April 7.

The cost of a failure of subsurface equipment in producing wells justifies more expensive preventive measures. Some of the available measures are: chemical injection, corrosion resistant alloys, non-metallic coatings or linings, and cathodic protection. B. E. Hunt

Parker, M. E. CORROSION AND ITS CONTROL. PART 50. EVALUATION OF CORROSION IN PRODUCING WELLS. *Oil Gas J.*, **50**, 191 (1952) April 15.

The evaluation of corrosion rates in new fields can be made by (a) periodic tubing surveys (b) observing side effects such as iron content, and (c) inserting and periodically examining coupons. B. E. Hunt

Corrosion Inhibition

Hackerman, N. PHYSICAL CHEMICAL ASPECTS OF CORROSION INHIBITION. *Corrosion* **8**, 143-149 (1952) April.

Corrosion inhibition on metal surfaces as recognized today is a complex physical-chemical phenomena, and more than one chemical is usually required to provide all of the inhibition requirements so that an adequate protection of the metal may be obtained. A theoretical approach in studying these phenomena is presented, using modern experimental methods such as X-ray diffraction, electron microscopes and radioactive chemicals. S. Mori

Plastic Pipe

Dye, G. G. SEVEN YEARS EXPERIENCE WITH PLASTIC SERVICES. *Gas*, **28**, 45-48 (1952) April.

Southern California Gas Co. has installed over 136,000 feet of new services and 276,000 feet of service replacements with plastic tubing. This was done at equal cost per service for new services and at 20% less than steel (hot-wrap) pipe for service replacements. Included are pictures describing the use of the plastic pipe. B. G. Lang

PLASTIC TUBING IS MAKING STRIDES. *Gas*, **28**, 49-50 (1952) April.

Summarized results of the *GAS* questionnaire on use of plastic tubing are given. Of 64 major gas utilities queried, 49 have had no experience with plastic tubing, but 6 are using it chiefly as service piping, and will continue, 5 have discontinued or failed to test it, 4 are planning to test it, and 24 expressed interest in its possibilities. B. G. Lang

13. NEW BOOKS

American Pipelines

Wolbert, G. S., Jr. AMERICAN PIPELINES, THEIR INDUSTRIAL STRUCTURE, ECONOMIC STATUS AND LEGAL IMPLICATIONS, Norman, Okla. University of Oklahoma Press (1952).

Legal and administrative problems of the petroleum pipeline industry were evident at its inception in 1865 and have grown with it in proportion as its growth has reacted upon the national economy. Great capital outlay and need for stable supply and markets has tended to concentrate the ownership of pipelines among a few large completely integrated refining companies which, because of the questions involving monopoly and common carriers, have become increasingly subject to governmental regulation. The book does not claim to solve the problems, but discusses the many issues, citing over 900 references to investigations and decisions. It indicates certain phases which will require much more study. O. P. Brysch

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American Society of Mechanical Engineers. Transactions
Analytica Chemica Acta
Analytical Chemistry
Applied Mechanics Review
Atomic Energy Newsletter
Australian Journal of Applied Science
Australian Journal of Scientific Research

Bibliography of Technical Reports
Bituminous Coal Research
Blast Furnace and Steel Plant
Brennstoff-Chemie
British Abstracts
British Coal Utilization Research Association Monthly Bulletin and Quarterly Gazette
Bulletin of the Atomic Scientists
Butane-Propane News

California Oil World
Canadian Chemical Processing
Canadian Gas Journal
Canadian Journal of Chemistry
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Ceramics
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Chemical Engineering Costs Quarterly
Chemical Engineering Progress
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Chemical Society (London) Journal
Chemical Week
Chemist
Chemistry
Chemistry and Industry
Coal Age
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Coke and Gas
Combustion
Compressed Air
Construction Methods and Equipment
Corrosion

Electronic Engineering
Endeavour
Engineers' Digest

Faraday Society. Transactions
Fuel
Fuel Abstracts
Fueloil and Oil Heat

Gas
Gas Age
Gas and Oil Power
Gas Heat
Gas Journal
Gas News (Chicago)
Gas Research Board Publications
Gas Times
Gas und Wasserfach
Gas World

Heating and Ventilating
Heating, Piping and Air Conditioning

Independent Petroleum Association of America Monthly
Industrial and Engineering Chemistry
Industrial Finishing
Industrial Gas (American)
Industrial Gas (British)
Industrial Heating
Institute of Fuel (British). Journal
Institute of Petroleum (British). Journal
Institute of Radio Engineers. Proceedings
Institute of Gas Technology Publications
Institution of Gas Engineers. Bulletins, Communications and Transactions
Instruments
Iron Age

Journal des Usines a Gaz
Journal of Applied Chemistry
Journal of Applied Mechanics
Journal of Applied Physics
Journal of Chemical Education
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Journal of Metals
Journal of Organic Chemistry
Journal of Petroleum Technology
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LP-Gas

Materials and Methods
Mechanical Engineering
Mining Engineering

National Fire Protection Association Quarterly
National Gas Bulletin
National Petroleum News
Nature (British)
Nucleonics

Official Gazette of the U.S. Patent Office
Oil and Gas Journal
Oil, Paint and Drug Reporter
Optical Society of America. Journal

Paint and Varnish Production
Petroleum
Petroleum Engineer
Petroleum Processing
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